U.S. FISH AND WILDLIFE SERVICE

FINAL
ENVIRONMENTAL ASSESSMENT

MINNESOTA VALLEY NATIONAL WILDLIFE REFUGE AND WETLAND MANAGEMENT DISTRICT

FIRE MANAGEMENT PLAN

U.S. Fish and Wildlife Service
3815 East 80th Street

Bloomington, Minnesota 55425

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FIRE MANAGEMENT PLAN

TABLE OF CONTENTS

1. PURPOSE AND NEED

1.1 Purpose

Policy of the U.S. Department of the Interior states that managers of refuge lands with vegetation capable of sustaining fire will develop a fire management plan (FMP) (910 DM 1). The Fish and Wildlife Service's Fire Management Handbook (621 FW 1.4-5) states that, "Every area with burnable vegetation must have an approved Fire Management Plan." This Environmental Assessment (EA) explores the various alternatives in which Service policy can be carried out, consistent with agency direction and analyzes the foreseeable impacts associated with an integrated fire management program.

This EA has been developed to evaluate environmental consequences of the revised FMP on the Minnesota Valley National Wildlife Refuge(Refuge) and Wetland Management District (WMD). This Fire Management Plan helps to achieve resource management goals and objectives as defined in: Minnesota Valley National Wildlife Refuge Environmental Impact Statement (May 1982), Master Plan (August 1982) and the Recreation Area and State Trail Comprehensive Plan (July 1984). The FMP is one of many step-down plans that build upon management actions outlined in the Refuge's Draft Comprehensive Conservation Plan (CCP). The Draft CCP designates prescribed burning as an important tool in maintaining and restoring grassland, wetlands and oak savanna on the Refuge. This FMP is further necessary to meet Service, Departmental and National policy mandates concerning fire management.

1.2 Need

The FMP for the Refuge has been developed to provide direction and continuity in establishing operational procedures to guide all fire management activities. The Refuge FMP is needed to guide us while implementing resource management objectives as defined in our *Draft Comprehensive Conservation Plan for Minnesota Valley National Wildlife Refuge*. The FMP will be updated as needed to comply with all permanent management plans as they are developed or modified for the Refuge. The Refuge currently has a FMP which was developed in 1983.

The goal of this FMP and the Alternatives developed is the management of wildland fire to:

1. Provide for the protection of life and property through reduction of hazardous fuel buildups.
2. Provide for protection and management of grasslands and early successional habitats required by Resource Conservation Priority species.
3. Implement a safe and cost effective program of resource protection and enhancement.
4. Reduce the probability of uncontrollable hot fires resulting from the buildup of hazardous fuels; and protect native biotic communities that are historically dependent on fire to maintain their diversity.

The alternatives detailed in this document will accomplish these needs to varying degrees.

1.3 Decisions that Need to be Made

Through public and staff input, the Regional Director (Region 3) of the Fish and Wildlife Service must decide whether to select the proposed action or one of the other alternatives as presented in this EA. The Regional Director must then decide whether the selected alternative is at a significance level that requires an Environmental Impact Statement be developed or whether a Finding of No Significant Impact (FONSI) determination can be made.

1.4 Background

Minnesota Valley NWR was established by Congress in 1976 through the Minnesota Valley National Wildlife Refuge Act (*Public Law 94-466; October 8, 1976*). In general, its purposes are to (1) provide habitat for a large number of migratory waterfowl, fish and other wildlife species; (2) to provide environmental education, recreational opportunities, and interpretive programs for hundreds of thousands of Twin Cities residents; (3) to protect important natural resource areas from degradation; and to (4) protect the valley's unique social, educational, and environmental assets.

The Act authorized the purchase of 9,500 acres for the Refuge. It also acknowledged the presence of the Minnesota Valley State Trail and the establishment of a wildlife recreation area, both to be administered by the Minnesota Department of Natural Resources (DNR). The specific lands, waters, and interests of the Refuge and the adjacent recreation area were to be identified through the development of a cooperatively prepared conservation plan. That plan was completed in 1984 and has served as the basis for Refuge development and management since that time. In 1984, the Act was amended to include an additional 2,000 acres into the Refuge. This amendment plus the addition of the Mittelstad tract (Rapids Lake Unit) in 1995 has increased the authorized Refuge acreage to approximately 14,000 acres.

In addition, the Refuge manages a 14 county Wetland Management District (WMD) which was established in 1984 when the Region implemented its broad-based Partners for Wildlife program. Between 1988 and 1994, several Farmers Home Administration easements within the 13-county district were assigned to the Refuge. Over 5,400 acres of fee and easement lands are administered as part of the District. In 2001, a fourteenth county was added to the District.

The primary purpose of the Minnesota Valley WMD is to administer a complex of wetlands, grasslands, and the limited amount of forests that provide good habitat for waterfowl, grassland nesting birds, and associated species. Secondary objectives of the District include providing wildlife dependent recreation, interpretation, and environmental education to area citizens. In addition, the restoration of wildlife habitats on fee, easement, and private lands contributes to the restoration and protection of the Minnesota and Cannon River watersheds.

The wide array of both resident and migratory species found on the Refuge is due to the varied habitat types found in the floodplain forest/grassland/riverine/wetland complex. The mix of floodplain forest, emergent wetlands and grasslands all contribute to the species diversity of the wildlife community found at the Refuge. Fire is a critical ecological process in maintenance of successional habitats required by many species of wildlife that are of management concern within the Region.

All alternatives considered within this EA deal with various combinations of 3 fire types; human-caused wildland fires, naturally occurring wildland fires and management ignited prescribed fires. Under all alternatives discussed within this EA, all human-caused wildland fires and all escaped management ignited prescribed fires will be suppressed. The following definitions are used throughout this document.

Suppression - All the work of extinguishing or confining a fire beginning with its discovery.

Management Ignited Prescribed Fire - Fire intentionally ignited to accomplish management objectives in specific areas under prescribed conditions identified in an approved Prescribed Fire Plan.

Naturally Ignited Wildland Fire - Fire ignited by natural means (usually lightning)

Appropriate Management Response - The specific actions taken in response to a wildland fire to implement protection and/or fire use objectives.

2. ALTERNATIVES

2.1 Alternatives not Considered for Detailed Analysis

An alternative of allowing all fires to burn at all times was initially considered but dismissed as not suitable for further consideration in the development of this proposal. This alternative was rejected because it fails to meet U.S. Fish and Wildlife Service policy in regards to potential liability for losses of life and property, as well as unacceptable environmental, social, and economic costs.

2.2 Features or Actions Common to All Alternatives

Known cultural resources will be protected under all alternatives.
Wildland fire or prescribed fire actions that result in ground disturbance are subject to Section 106 of the national Historic Preservation Act. Evidence of a previously undetected cultural resource may be encountered. If the discovery is during an emergency wildland fire, the project leader shall immediately notify the Regional Historic Preservation Officer. If the discovery is during a prescribed fire, the project leader shall safely suspend all activities on any part of the prescribed fire that would impact the cultural resource and notify the Regional Historic Preservation Officer. The Regional Historic Preservation Officer shall take immediate steps to have the cultural resource evaluated and protected, as appropriate, to the extent required by law and policy. This may require arranging for a qualified professional to visit and evaluate the site's importance and recommend a course of action. An evaluation and decision on the disposition of the cultural resource should be made within 48 hours of the discovery unless the project's schedule allows greater flexibility. The Regional Historic Preservation Officer should work closely with the State Historic Preservation Officer and, as necessary, the Advisory Council in developing and implementing actions that take into account the effects of the undertaking on the cultural resource. In those instances where the discovered cultural resource is subject to the requirements of the Archeological and Historic Preservation Act (AHPA), the Regional Historic Preservation Officer should seek the guidance of the Federal Preservation Officer before proceeding with corrective measures. If necessary, the Federal Preservation Officer shall be responsible for contacting the Office of the Departmental Consulting Archaeologist, National Park Service, on issues concerning cultural resources protected under the AHPA.

Refuge operations and maintenance funds (subactivity 1261) will pay the cost of these activities unless the action is an emergency archeological and historic property survey in unstable areas prone to further degradation (i.e., erosion) following a wildland fire or in association with an emergency fire rehabilitation treatment. Emergency archeological and historic property surveys in unstable areas prone to further degradation (i.e., erosion) following a wildland fire or in association with an emergency fire rehabilitation treatment, and archeological, historic structure, cultural landscape, and traditional cultural property resource stabilization and rehabilitation can be funded with emergency rehabilitation funding (subactivity 9262).

2.3 Alternatives Carried Forward for Detailed Analysis

2.3.1 Alternative A - Management Ignited Prescribed Fire and Full Suppression of Wildland Fire - The Proposed Action (No Action)

This Alternative would allow the Refuge to use prescribed fire in pre-determined areas, within pre-planned conditions, to accomplish specific resource management objectives. Management ignited prescribed fires would be used by managers to reduce fuel hazards and simulate natural fire processes. Fire hazards around Refuge boundaries would be reduced. This alternative strives to maintain the 4,649 acres of grassland, 1,540 acres of wet meadows and fens, 7,569 acres of wetlands and 732 acres of oak savanna and oak woodland habitats that currently exist within Minnesota Valley NWR and WMD. Under this alternative, all human caused wildland fires and natural ignitions would be fully suppressed.

2.3.2 Alternative B - Full Suppression

The Refuge is abiding by current Departmental and Service policies that require full suppression of all wildland fires and preclude management ignited prescribed fires for all refuges without an approved FMP. Under this alternative all ignitions, including those of both natural and human-caused origin, would be suppressed and no management prescribed fires would be conducted. This Alternative summarizes actions that the Refuge would take until we have an approved FMP (No Action Alternative).

Under this alternative all ignitions, including those of both natural and human-caused origin, would be suppressed and no management prescribed fires would be conducted. Hazard fuel reduction would be accomplished by mechanical methods to the extent practical and consistent with land management objectives.

2.3.3 Alternative C - Management Ignited Prescribed Fire and Appropriate Management Response to Wildland Fire

This Alternative, like Alternative A, would enable the Refuge to use prescribed fires in pre-determined areas, within pre-planned conditions, to accomplish specific resource management objectives. Fire hazards around Refuge boundaries would be reduced under this alternative. This Alternative differs from Alternative A in that naturally caused wildland fires would be allowed to burn depending on the appropriate management response developed from an analysis of the local situation, values to be protected, management objectives, external concerns, and refuge objectives when the fire occurs. Suppression would be undertaken on naturally ignited wildland fires that threaten life, property,

resources or exceed prescription limits developed for that fire.

Like Alternative A, this Alternative strives to maintain the 4,649 acres of grassland, 1,540 acres of wet meadows and fens, 7,569 acres of wetland and 732 acres of oak savanna and oak woodland habitats that currently exist within Minnesota Valley NWR and WMD.

3 AFFECTED ENVIRONMENT

3.1 Physical Characteristics

The majority of the Refuge today lies within the Minnesota River Valley flood plain. The bluffs which line the valley provide the only significant change in elevation in the area immediately adjacent to the Refuge. The highest of the bluffs measures 930 feet above sea level, while the average elevation at the surface of the river is 688 feet.

Most units except Chaska, Black Dog and Wilkie have some significant blufflands and uplands. The bluffs are composed almost entirely of highly erodible, sandy soils which are difficult to control, stabilize, and revegetate once disturbed.

Waterfowl production areas and easements are mainly located south of the Twin Cities metro area. The predominant land use is intensive agriculture, mainly soybeans and corn. As the metro population increases, much of this area is being converted to suburban homes, hobby farms and recreational areas. Remnant habitats found throughout the WMD include tallgrass prairie, prairie pothole, floodplain forest, upland forest and oak savanna. Topography varies from flat agricultural land in western Sibley County to rolling forested areas in eastern Rice County.

The Lower Minnesota River Valley is under the influence of a moist continental climate, characterized by cold, relatively dry winters, and warm, moist summers. Rapid fluctuations of temperatures are common. Annual precipitation averages 28.3 inches, with the wettest times falling in the late spring and early summer. The average seasonal snowfall is 57.3 inches. The coldest temperatures generally occur in January, with lows reaching down to -35 degrees F. July is the warmest month, with a record high of 108 degrees F. The frost-free season generally begins in early May and runs through late September. Prevailing wind direction varies from the NW from November through April, to the S and SE during the remaining months. The average wind speed is 10.5 miles per hour. The highest 1 minute blow on record was 51 miles per hour. Peak wind gusts have been recorded up to 71 miles per hour.

3.2 Biological Resources

3.2.1 Habitat/Vegetation

The following habitat types were derived from 1997 aerial photos. Photo interpretation was completed in 2000 and 2001. Refuge lands were ground checked during the 2000 and 2001 field season. Habitat acreages for the WMD are based on tract habitat information in our management files. Original habitat classifications follow the standard in the Minnesota Land Cover Classification System. Classifications have been combined into general habitat types to remain consistent with the Fire Management Plan and the CCP. Individual classifications were based on a minimum detection size of 5 acres. Habitat acreage includes all fee and easement lands in the WMD and all lands within the authorized Refuge boundary.

Emergent wetlands comprise 7,569 acres (39%) of the Refuge and WMD. The primary species in the wetlands include river bulrush (*Scirpus fluviatillis*), cattail (*Typha angustifolia*), arrowhead (*Sagittaria latifolia*), and duckweed (*lemna spp*). Emergent wetlands include spring fed floodplain lake marshes that average four feet in depth and prairie potholes ranging in size from less than an acre to 75 acres.

Our second most abundant habitat on the Refuge and WMD is grassland. This habitat type makes up 4,649 acres (24%) of the Refuge and WMD. The primary grassland species are big bluestem (*Andropogon gerardi*), little bluestem (*Andropogon scoparius*), switchgrass (*Panicum virgatum*), Indian grass (*Sorghastrum nutans*), and brome grass (*Bromus ciliatus*).

Other habitat types include 3,984 acres (21%) flood plain forest, 1,540 acres (8%) wet meadow, 732 acres (4%) oak savanna and oak woodland, 226 acres (2%) of upland forest, 437 (2%) acres of cropland, and approximately 63 acres (0.5%) of bare soil and paved areas.

3.2.2 Threatened, Endangered and Candidate Species

Minnesota Valley NWR is within the range of the federally threatened bald eagle (*Haliaeetus leucocephalus*). There are several active bald eagle nests on the Refuge. Bald eagles commonly use the Minnesota River and associated floodplain habitats during migration. All riparian and lacustrine, palustrine and riverine and adjacent habitats would be considered suitable for bald eagles. Bald eagles have been sighted on several WPAs but there are no active eagle nests on any WPAs or easements.

3.2.3 Other Wildlife Species

The Refuge provides habitats for, and subsequently attracts, an abundance of wildlife species. Thirty species of amphibians and reptiles, at least 50 species of mammals, and over 250 species of birds have either been recorded or can reasonably be expected to be present on the Refuge and WMD for a portion of the year.

3.3 Land Use

The Refuge is situated along 34 miles of the lower Minnesota River between Jordan and Fort Snelling in the Minneapolis-St. Paul south metro area. It is located in Dakota, Hennepin, Carver and Scott Counties. Portions of the Refuge fall within the following cities: Bloomington, Eagan, Burnsville, Eden Prairie, Savage, Shakopee, Chanhassen, Chaska, Carver, and Jordan. Over three million people live within the Twin Cities metropolitan area. The WMD is located in the following counties: Dakota, Scott, Carver, Hennepin, Rice, LeSueur, Waseca, Steele, Blue Earth, Sibley, Nicollet, Washington, Ramsey and Chisago. The predominant land use in the WMD is agriculture and rural residential housing. See the attached map of the Refuge and Wetland Management District.

3.4 Cultural/Paleontological Resources

Approximately 2% of the Refuge and WMD has been surveyed for archeological resources. There are 32 known sites on the Refuge and no known sites on the Wetland Management District lands. Important structures on the Refuge that may need protection during fire activities include the Jabs farm and the Ahmiller house on the Louisville Unit and the stone house on the Rapids Lake Unit.

3.5 Local Socio-economic Conditions

According to the 2000 census, the population within the four counties where the Refuge is located is 1,631,807. Within the 14 county WMD, the total population in the 2000 census was 2,621,438. Land use surrounding the Refuge is urban development, rural residential housing and on the upstream end of the Refuge, agricultural. Predominant land use within the WMD is agriculture.

3.6 Fire Planning and Cooperative Efforts

For all management ignited prescribed fires, a prescribed burn plan is prepared that specifies the conditions under which a prescribed fire may be started. Minimum crew size and training, specific

weather conditions including relative humidity and acceptable ranges of wind speed and direction are some of the conditions outlined in the plan. The sequence of lighting the prescribed fire as well as the locations of fire breaks is included on an aerial photo in each prescribed burn plan. Each plan contains an operations guide which outlines crew responsibilities as well as emergency procedures and the location of contingency resources such as fire departments or DNR crews that may be able to respond in case of a problem on the prescribed fire. In an effort to increase our capability to respond to naturally occurring wildland fires and have a backup plan for prescribed fires, the Refuge maintains cooperative agreements with several local fire departments. The Refuge also maintains contact with local fire dispatch centers or fire departments prior to prescribed fires and also during any naturally occurring wildland fires.

The Refuge maintains a trained fire crew as well as several pieces of fire equipment that are available for prescribed fires or wildland fire response.

4 ENVIRONMENTAL CONSEQUENCES

4.1 Alternative A - Management Ignited Prescribed Fire and Full Suppression of Wildland Fire - (Proposed Action-No Action)

4.1.1 Soil and Water Resources

Implementation of this alternative would seek to minimize impacts on soil and water resources by controlling the area, timing, and intensity of management ignited prescribed fires but these impacts could not be totally eliminated. Areas of high fuel concentrations would be reduced under this alternative which would, in turn, decrease the likelihood of extreme fire events. Short-term impacts from management ignited prescribed fires would be greater for this alternative compared to Alternative B and the same as Alternative C.

4.1.2 Vegetation and Fuels

Under this alternative management ignited prescribed fires could help maintain vegetation communities and reduce accumulations of fuels which contribute to larger fires. Fire is part of the natural cycle which helps maintain areas as grassland, oak savanna or early successional wetlands.

4.1.3 Wildlife

Under this alternative, conditions favorable to fire dependent wildlife species would be simulated but not in the exact manner created by natural ignitions. The use of management ignited prescribed fires would lessen the build-up of fuels and lessen the intensity of all wildland fire types (natural or human-ignited). The distribution of habitat types, and the wildlife species that depend on these habitats, would be determined by management ignited prescribed fire location, timing, conditions, and patterns of burning. Prescribed fire could be implemented to stimulate plant growth, remove non-native plant species, and eliminate downed fuels.

4.1.4 Endangered and Threatened Species

The effects of the fire program on federally endangered and threatened species has been evaluated in an Endangered Species Act Section 7 consultation with the Twin Cities Ecological Services Field Office. Initial indications are that there would be no effect on the bald eagle (*H. Leucocephalus*), the only listed species found on the Refuge and WMD. A copy of the Section 7 consultation is attached to the environmental assessment.

4.1.5 Cultural Resources

Known cultural resources would be protected under this and all other Alternatives. Historic structures on the Refuge will be protected during all management ignited prescribed fires. The use of management ignited prescribed fires under this Alternative would reduce fuels and lessen the chance of an extreme fire occurring. The effects of suppression activities on cultural resources would be avoided under this and all other Alternatives. Previously unknown resources discovered as a result of fire operations will be treated as outlined in Section 2.2.

4.1.6 Visual/Aesthetics/Air Shed

Under this Alternative, effects of management ignited prescribed fires could be controlled. Short term smoke episodes would still be possible under this alternative, but fuels reduction through management ignited prescribed fires would greatly reduce episodes of severe air pollution due to large, uncontrolled wildland fires. Because of the location of many fire units adjacent to neighboring residences and businesses, management ignited prescribed

fires are conducted under specific wind and weather conditions to minimize smoke impacts. Wind and weather prescriptions for fire units located near the Minneapolis St. Paul International Airport and major highways are very specific in terms of wind direction and speed. Every effort is made to minimize potential impacts on these smoke sensitive areas. Current and predicted weather conditions are carefully considered before lighting any management ignited prescribed fire.

4.1.7 Visitor Use/Safety

This alternative provides for the most natural habitats for visitor use. Due to timing of fire occurrence and conditions effecting fire behavior, visitors and Refuge neighbors at certain times could be inconvenienced. Sections of the Refuge may be closed on a short term basis during prescribed fires to provide for visitor safety. Hazards would still be encountered while performing suppression duties due to direct flame exposure, respiratory problems associated with smoke inhalation, and the use of equipment under conditions of poor visibility.

4.1.8 Economic

Reduction of hazardous fuels near structures and other capital improvements would reduce potential economic losses from a catastrophic fire. Use of management ignited prescribed fires would minimize the risk of escaped fires due to the preplanning process associated with prescribed burning. No direct or indirect economic impact (positive or negative) to the surrounding communities is anticipated with this Alternative.

4.1.9 Cumulative Impacts

No cumulative loss of early successional habitats or contiguous forest would result at Minnesota Valley NWR and WMD from implementation of this alternative. This alternative strives to maintain the 4,649 acres of grassland, 1,540 acres of wet meadows and fens, 7,569 acres of wetlands, and 732 acres of oak savanna and oak woodland habitat. The goal for habitat distribution on Refuge lands follows the philosophy of restoration to pre-settlement conditions. Fire is used as a tool to establish or manage these habitat types.

4.2 Alternative B - Full Suppression

4.2.1 Soil and Water Resources

Impacts on water quality would be negligible with low intensity fires. Over time, with the build-up of fuels, the chance of a severe fire would increase. In the event a high intensity fire did occur, an increase in surface runoff leading to soil erosion and siltation could be expected. The long-term impacts to soil and water resources is estimated to be greatest under this alternative because a high intensity fire may cause severe erosion.

4.2.2 Vegetation and Fuels

This alternative could create an unnatural increase in fuel conditions leading to increased potential for larger wildland fires with greater intensities. The elimination of frequent, light-burning fires would change the composition of vegetation and allow the hazardous build-up of combustible fuels. This could result in more extreme burning conditions in which wildland fires become larger and more dangerous. Over time, as the present early successional vegetation is replaced by mature forest, fire behavior would be expected to decrease. Full suppression without the inclusion of management ignited prescribed fires would reduce species diversity by excluding fire dependent, shade intolerant species. Important habitats on the Refuge, including oak savanna and prairie would eventually succeed to full canopy forest. Fens and wet meadow would also succeed to shrub communities. The loss of these three fire dependent communities on the Refuge may lead to a reduction in diversity especially in early successional plant species.

4.2.3 Wildlife

Species dependent upon fire influenced ecosystems could decline and be replaced by species more tolerant of conditions created when fire is removed as an ecological process. Grassland dependent species would be replaced by more forest dependent species.

4.2.4 Endangered and Threatened Species

The effects of all Alternatives on federally endangered and threatened species is currently being reviewed in an Endangered Species Act Section 7 consultation with the Twin Cities

Ecological Service's Field Office. No impacts to the bald eagle *(H. leucocephalus*) are anticipated. The effects of suppression activities on endangered or threatened species would be similar with all alternatives.

4.2.5 Cultural Resources

Cultural resources susceptible to damage by fire could be degraded by high intensity fires beyond the ability of suppression forces to control. High intensity fires are more likely to occur under this alternative due to the accumulation of dead vegetation and downed woody materials (excess fuels) as a result of total fire suppression. Impacts to historic structures or cultural resources may be greatest under this alternative. Previously unknown resources discovered as a result of fire operations will be treated as outlined in Section 2.2.

4.2.6 Visual/Aesthetics/Air Shed

This alternative eliminates short term effects such as scorching of vegetation that result from smaller, and more frequent prescribed fires. Infrequent high intensity fires which could occur over time would result in considerable changes in the appearance of affected areas. Under this alternative there would be a short term reduction in the generation of particulate emissions from fires because of control actions. However, there is the potential for severe episodes of air pollution due to large, uncontrolled wildland fires.

Impacts on smoke sensitive areas such as the airport and highways are unpredictable and may result in complications with operations of these transportation facilities. Although large uncontrolled wildland fires may be infrequent, the buildup of fuels and the unpredictable wind speed and direction during a wildland fire may have a greater negative smoke impact on neighbors than any of the other alternatives.

4.2.7 Visitor Use/Safety

There are minimal appreciable short term impacts on Refuge visitor use under this alternative. Loss of fire dependent communities such as oak savanna, prairie, wet meadows and fens may limit the ability of the Refuge to provide interpretation and education about these habitats to the public. Open areas could be potentially closed to visitor use and access during suppression activities. Wildland fire suppression is hazardous by nature. The inherent safety risks associated with small fires are compounded on larger,

high intensity fires, not only for firefighters, but for the public as well. Hazards include direct flame exposure, respiratory problems associated with smoke inhalation, and the use of equipment under conditions of poor visibility.

4.2.8 Economic

Reduction of hazardous fuels near structures and other capital improvements through the use of management ignited prescribed fires would not occur under this Alternative. Due to the build-up of hazardous fuels, the threat to capital improvements would be greater under this alternative than under either Alternative A or C. Costs associated with the suppression program steadily increase with the accumulation of fuel. High intensity fires potentially would be costly to suppress and could cause economic disruption through the loss of natural resources, capital improvements, visitor access opportunities, and deteriorated visitor experiences. There is potential for a negative economic impact to local communities if a large uncontrollable wildfire occurs on the Refuge and fire crews are unable to control it before neighboring buildings are threatened or destroyed.

4.2.9 Cumulative Impacts

A significant increase in mature and contiguous forests would occur through time under this Alternative. Benefits to interior forest migratory birds and animals would likely occur over time.

Significant cumulative loss of early successional and fire dependent habitats such as prairie, oak savanna, wet meadow and fens would occur. This alternative would lead to the loss of over 4,500 acres of grassland and 2,500 acres of other early successional habitats that currently exist within Minnesota Valley NWR and WMD.

In Minnesota, over 90% of the original grasslands have been lost to agricultural and urban development activities by humans. The remaining habitat serves an important role in maintaining populations of many grassland dependent bird species. Over 99% of the original oak savanna in the Midwest has been lost to development or agriculture, making oak savanna one of the rarest habitats in the Midwest. Suppression of fire in the remaining oak savannas has resulted in a decrease in the biological diversity of the savannas as these areas succeed to mature forest.

4.3 Alternative C - Management Ignited Prescribed Fire and Appropriate

Management Response to Wildland Fire

4.3.1 Soil and Water Resources

Due to the low frequency of naturally ignited wildland fires (every 50-100 years) anticipated under Alternative C, water quality and soil resource impacts would be considered the same as Alternative A. Impacts from management ignited prescribed fires would also be the same as Alternative A.

4.3.2 Vegetation and Fuels

Impacts to vegetation and fuels would be similar to Alternative A, management ignited prescribed fires could help maintain historic vegetation communities and reduce accumulations of fuels which contribute to larger fires. The impacts of tactical suppression operations against wildland fires would be similar to those described under Alternative A and B.

4.3.3 Wildlife

Impacts would be similar to option A given the infrequency of naturally ignited fires.

4.3.4 Endangered and Threatened Species

The effects of all Alternatives on federally endangered and threatened species is currently being reviewed in an Endangered Species Act Section 7 consultation with the Twin Cities Ecological Service's Field Office. No impacts to the bald eagle *(H. leucocephalus*) are anticipated. The effects of suppression activities on endangered or threatened species would be similar with all alternatives.

4.3.5 Cultural Resources

The scheduled nature of burning under this alternative provides the ability to plan, locate, and consequently avoid the disturbance of known cultural resources resulting from either

ignition or fire control activities. Known cultural resources would be protected under this and all other Alternatives. The use of management ignited prescribed fires under this Alternative would reduce fuels and lessen the chance of an extreme fire occurring. The effects of suppression activities on cultural resources would be avoided under this and all other Alternatives. Previously unknown resources discovered as a result of fire operations will be treated as outlined in Section 2.2.

4.3.6 Visual/Aesthetics/Air Shed

Under this Alternative, effects of management ignited prescribed fires could be controlled. . Because of the location of many fire units adjacent to neighboring residences and businesses, management ignited prescribed fires are conducted under specific wind and weather conditions to minimize smoke impacts. Wind and weather prescriptions for fire units located near the MSP International Airport and major highways are very specific in terms of wind direction and speed. Every effort is made to minimize potential impacts on these smoke sensitive areas. Current and predicted weather conditions are carefully considered before lighting any management ignited prescribed fire.

Short term smoke episodes would still be possible under this alternative, but fuels reduction through management ignited prescribed fires would greatly reduce episodes of severe air pollution due to large, uncontrolled wildland fires.

Smoke impacts from allowing naturally ignited wildland fires to burn are unpredictable and may result in intense short term impacts on neighbors and visitors

Impacts on smoke sensitive areas such as the airport and highways are also unpredictable and may result in complications with operations of these transportation facilities.

4.3.7 Visitor Use/Safety

This alternative provides for the natural habitats for visitor use. Due to timing of fire occurrence and conditions effecting fire behavior, visitors and Refuge neighbors at certain times could be inconvenienced. Sections of the Refuge may be closed on a short term basis during prescribed fires to provide for visitor safety. Hazards would still be encountered while performing suppression duties due to direct flame exposure, respiratory problems associated with smoke inhalation, and the use of equipment under conditions of poor visibility.

During naturally ignited wildland fires, this alternative may entail some disruptive effects to Refuge visitors. Operational activities could limit visitor use and access to open portions of the Refuge. Smoke production could detract from visual enjoyment and further restrict access on public roads and trails. Hazards associated with suppression of wildland fires remain the same as those associated with Alternatives A and B.

4.3.8 Economic

Reduction of hazardous fuels near structures and other capital improvements would reduce potential economic losses from a catastrophic fire. Use of management ignited prescribed fires would minimize the risk of escaped fires due to the preplanning process associated with prescribed burning. Naturally ignited wildland fires have the potential to cause damage to historic structures or buildings adjacent to the Refuge.

4.3.9 Cumulative Impacts

Cumulative impacts for this alternative are the same as Alternative A given the infrequency of naturally ignited wildland fires. This alternative strives to maintain the 4,649 acres of grassland, 1,540 acres of wet meadows and fens, 7,569 acres of wetlands, and 732 acres of oak savanna and oak woodland habitat. The goal for habitat distribution on Refuge lands follows the philosophy of restoration to pre-settlement conditions. Fire is used as a tool to establish or manage these habitat types.

4.4 Summary of Environmental Consequences by Alternative

	Alternative A (Proposed Action)	Alternative B	Alternative C
Soil and Water Resources	Minor short-term impacts from prescribed fires	Periodic extreme fire event could cause severe erosion	Minor short-term impacts from prescribed fires
Vegetation and Fuels	No change from current condition is expected.	Gradual increase in size of vegetation and fuels and possible severe fire activity	No change from current condition is expected
Wildlife	No immediate change from current condition is expected. Continued management for fire dependent habitats and species dependent on them.	Gradual elimination of species that depend on early successional vegetation.	No change from current condition is expected
Endangered and Threatened Species	No change from current condition is expected	No change from current condition is expected.	No change from current condition is expected
Cultural Resources	No change from current condition is expected	Extreme fire conditions as a result of fuel buildup may result in damage to historic structures or cultural resources.	No change from current condition is expected
Visual/Aesthetics/ Air Shed	No change from current condition is expected. Impacts should be predictable due to prescribed fire planning.	Periodic extreme fire events could cause impacts to visual/aesthetics/air shed.	No change from current condition is expected. Potential extreme impacts from natural wildland fires.

	Alternative A (Proposed Action)	Alternative B	Alternative C
Visitor Use/Safety	No change in visitor use expected and continued current level of risk to firefighting personnel.	Increased longterm risk to firefighting personnel but no change in visitor use expected.	Increased risk to firefighting personnel but no change in visitor use expected.
Economic	Lower risk to structures on the Refuge. No economic impact off Refuge.	Increased risk to Refuge structures due to build-up of dangerous fuels. Potential for a negative economic impact off Refuge in the case of an uncontrollable wildland fire.	Increased risk to Refuge structures due to potential wildland fire escape. No economic impact off Refuge.
Cumulative Impacts	No change from current conditions.	Increase in contiguous forest on the Refuge. The reduction in valuable early successional and grassland habitats would decrease the number of grassland dependent bird species using the Refuge. Many of these species have been suffering continental declines due to loss of habitat.	Same as Alternative A.

5 List of Preparers

Tom Kerr, Minnesota Valley NWR, 3815 East 80th Street, Bloomington, MN 55425

6 Coordination and Consultation With the Public and Others

During the preparation of the Minnesota Valley NWR's FMP and this EA, consultation and coordination

occurred between this office and and several other FWS and DNR offices. Endangered Species intra-Service Section 7 consultation was completed concurrently with the review of this EA by the public. The Intra-Service Section 7 Consultation is complete. It was reviewed by the Twin Cities Ecological Services Field Office.

Press releases about the plan and the public comment period were provided to all Twin Cities metro area newspapers as well as the ten major newspapers in the Wetland Management District Counties. Press releases were also posted at seven libraries and five City Halls. A copy of the Fire Management Plan was available for public review and comment at the Refuge Visitor Center. Copies of the plan were made available to interested parties in paper or compact disk format. A copy of the plan was provided to the Metropolitan Airport Commission for review and comment. Copies of the plan were also provided to the ten fire departments that provide fire coverage for Refuge and WMD lands. The plan and EA was available for a 30 day comment period.

7 Public Comment on Draft EA and Response

Number	Public Comment	Refuge Response
1	Hamburg Fire Chief: The Fire Chief listing for the Norwood/Young America Department should be updated.	The correction was made in the Fire Management Plan
2	Hamburg Fire Chief: The Hamburg Fire Department is willing to help with any projects they can. They also help with mutual aid response with other departments that cover the Refuge. The Hamburg Fire Department would like to set up a cooperative agreement with the Refuge.	The Refuge appreciates the offer of support. The Refuge will work with the Hamburg Fire Department this year to set up a cooperative agreement.

3	Private citizen #1: Expressed opposition to "the U.S. Fish and Wildlife Service initiation of "prescribed burns" in an urban setting. These burns have negative impacts on the surrounding population and properties."	Prescribed burning is an important tool to reduce buildup of fuels that may lead to large uncontrollable wildfires. Prescribed burning is also an important tool for maintaining and managing many types of fire dependent habitat such as oak savanna and native prairie. The Refuge attempts to minimize negative impacts to the surrounding population by burning under very narrow prescriptions. Unexpected weather changes may cause some short term smoke exposure for some Refuge neighbors.
4	Private citizen #1: "A required phase of a prescribed burn should be advance warning to owners in areas that may be affected so they can take damage-minimizing precautions, such as closing windows, and to alert them to examine their properties afterward for any damage. In addition, an after-the-fact canvassing of affected areas should be conducted to inform owners of the occurrence, prompting them to examine their property for any resulting damage."	The Refuge will provide press releases to local newspapers at the start of the prescribed fire season. It is very difficult to contact neighbors before and after a prescribed fire since the unit to be burned is usually chosen the morning of the burn. This is done because each burn has very specific weather, wind direction, temperature and other conditions that must be met before the fire is started. Contacts before or after a burn in an urban setting would require a large amount of staff time. Because there may be unexpected wind shifts, a landowner who feels they are affected should contact the Refuge immediately. Since there are occasional wildfires on the Refuge, it would be important to determine if the damage is caused by a wildfire or a prescribed fire.

5	Private citizen #1: "While prescribed burning may have positive results for refuge property, they are not compatible with urban living. The unique refuge setting creates unique responsibilities that require greater precautions and protections for Refuge neighbors."	Minnesota Valley is one of a very few urban refuges in the nation. This means that it provides a unique opportunity for a large metro population to enjoy the many aspects of a having wildlife refuge in their back yard including educational opportunities and the chance for inner city populations to enjoy a refuge experience. This unique relationship between wildlife refuge and urban development will require a minimal amount of compromise from riparian neighbors regarding certain management actions such as burning. Typically, a unit is burned once every five to seven years, so a riparian neighbor may, under a worst case scenario, have some disturbance for a single day once every five to seven years. Most neighbors appear to feel that this is worth living adjacent to a refuge for the remainder of the time.